

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 8370 (1977): Iron powder for powder metallurgical applications [MTD 25: Powder Metallurgical Materials and Products]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



Indian Standard

**SPECIFICATION FOR
IRON POWDERS FOR POWDER
METALLURGICAL APPLICATIONS**

(First Reprint MAY 1983)

UDC 669.1-492.2



© Copyright 1977

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR IRON POWDERS FOR POWDER METALLURGICAL APPLICATIONS

Powder Metallurgical Materials and Products Sectional
Committee, SMDC 30

Chairman

DR R. V. TAMHANKAR

Representing

Ministry of Defence (R & D)

Members

SRI N. T. GEORGE (Alternate to Dr R. V. Tamhankar)	
SRI B. K. BANERJEE	The All India Automobiles & Ancillary Industries Association, Bombay
SRI T. N. CHANDRAMOULI (Alternate)	
SRI S. K. BASU	Indian Oxygen Limited, Calcutta
SRI R. BANERJEE (Alternate)	
DR R. D. BHARGAVA	Zell Ate Limited, Bombay
SRI A. A. RAHIMTULLA (Alternate)	
SRI P. G. BHATT	Flexicons Limited, Bombay
SRI B. G. SHAH (Alternate)	
SRI J. BHATTACHARYA	National Metallurgical Laboratory (CSIR), Jamshedpur
SRI J. P. TIWARI (Alternate)	
SRI B. C. BISWAS	National Test House, Calcutta
SRI P. K. CHATTERJEE	Ministry of Defence (DGI)
SRI P. K. GANGOPADHYAY (Alternate)	
SRI T. R. GUPTA	Indian Hard Metals Pvt Limited, Calcutta
SRI K. C. MITTAL (Alternate)	
SRI B. M. KATARIA	Mahindra Sintered Products Limited, Pune
SRI S. R. SUNDARAM (Alternate)	
SRI S. P. KHOSLA	Khosla Metal Powders Pvt Limited, Pune
SRI M. M. KAUL (Alternate)	
SRI LAKSHMAN MISHRA	Directorate General of Technical Development, New Delhi
SRI T. R. MOHAN RAO (Alternate)	
SRI D. Y. MOGHE	Directorate General, Ordnance Factories (Ministry of Defence), Calcutta
SRI A. PADMANABAN	Ashok Leyland Limited, Madras
SRI P. PHILIP	Indian Aluminium Co Ltd, Calcutta
SRI P. N. PHADKE (Alternate)	

(Continued on page 2)

© Copyright 1977

INDIAN STANDARDS INSTITUTION

This publication is protected under the Indian Copyright Act (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

Members

DR R. V. RAGHAVAN
 SHRI S. V. PAI BHALE (*Alternate*)
 SHRI U. MOHAN RAO
 DR N. R. SANJANA
 DR N. SEN
 SHRI S. K. SEN GUPTA
 SHRI R. SEINIVASAN

Representing

Bhabha Atomic Research Centre, Bombay
 Bharat Heavy Electricals Limited, Bhopal
 Sandvik Asia Limited, Pune
 Tata Iron & Steel Co Ltd, Jamshedpur
 Advani-Oerlikon Private Ltd, Bombay
 Central Electrochemical Research Institute
 (CSIR), Karaikudi

SHRI P. V. VASU DEVA RAO (*Alternate*)
 SHRI R. SRINIVASAN

Widia (India) Ltd, Bangalore

SHRI Y. S. BHATT (*Alternate*)
 PROF G. S. UPADHYAYA

Powder Metallurgy Association of India,
 Hyderabad

SHRI S. K. AGRAWAL (*Alternate*)
 SHRI C. R. RAMA RAO,
 Director (Struc & Met) (*Secretary*)

Director General, ISI (*Ex-officio Member*)

Indian Standard

SPECIFICATION FOR IRON POWDERS FOR POWDER METALLURGICAL APPLICATIONS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 25 February 1977, after the draft finalized by the Powder Metallurgical Materials and Products Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Iron powder is used for various applications like welding electrode coating, gas cutting, sintered bearings and structural components for various equipments.

0.3 This standard contains clauses 4.1.1, 5.1 and 8.1 which call for agreement between the purchaser and the manufacturer.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard specifies the requirements of iron powders, used in the manufacture of sintered metal parts and bearings.

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of iron powder shall be as laid down in IS : 1387-1967†.

3. GRADES

3.1 The material shall be of two grades, namely, Grade 1 and Grade 2. The manufacturer shall specify the method of production of iron powder.

*Rules for rounding off numerical values (*revised*).

†General requirements for the supply of metallurgical materials (*first revision*).

4. CHEMICAL COMPOSITION

4.1 The chemical composition of the material shall be as given in Table 1.

4.1.1 The methods of chemical analysis shall be as agreed to between the purchaser and the manufacturer till appropriate Indian Standards for methods of chemical analysis are formulated by ISI.

4.1.2 The hydrogen loss shall be determined in accordance with IS : 5644-1970*.

4.1.3 *Acid-Insoluble Content*—The acid-insoluble content shall be determined in accordance with IS : 7438-1974†.

TABLE 1 CHEMICAL COMPOSITION

(Clause 4.1)

SL No.	CONSTITUENT	REQUIREMENT FOR	
		Grade 1 Percent, Max	Grade 2 Percent, Max
(1)	(2)	(3)	(4)
i)	Carbon	0.02	0.02
ii)	Sulphur	0.015	0.005
iii)	Phosphorus	0.015	0.01
iv)	Hydrogen loss	0.3	0.3
v)	Acid insolubles	0.2	0.1

5. SIEVE ANALYSIS

5.1 The sieve analysis of the material when carried out in accordance with IS : 5461-1969‡ shall be as given below; for size between -45 and +150 microns the value shall be as agreed to between the purchaser and the manufacturer:

Grade 1

Sieve Size Micron	Percent of Powder Max
+ 212	Nil
+ 180	0.5
+ 150	2
- 45	15 to 20

*Method for determination of hydrogen loss of copper, tungsten and iron powders.

†Method of test for acid-insoluble content of copper and iron powders.

‡Method for sieve analysis of metal powders.

Grade 2

<i>Sieve Size Micron</i>	<i>Percent of Powder Max</i>
+ 212	Nil
+ 180	2
+ 150	3 to 10
— 45	20 to 35

6. PHYSICAL PROPERTIES

6.1 Apparent Density — The apparent density of different grades of material when tested in accordance with IS : 4848-1968* shall be as given below:

<i>Grade</i>	<i>Apparent Density g/cm³</i>
1	2.4 to 2.7
2	2.7 to 3.0

6.2 Flow Rate — The flow rate of Grades 1 and 2 material when determined in accordance with IS : 4840-1968† shall not be more than 32 s/50 g.

6.3 Compressibility — Unlubricated powder when pressed with a pressure of 400 N/mm² in accordance with IS : 4857-1968‡ should attain a minimum 6.2 g/cm³ green density.

6.3.1 Powder particles should not be spherical and preferably of irregular shape.

7. SAMPLING

7.1 The sampling of powders for conducting the various tests shall be done in accordance with IS : 6492-1972§.

8. PACKING

8.1 The material shall be supplied packed in suitable containers in quantities mutually agreed to between the purchaser and the manufacturer.

9. MARKING

9.1 Each container of iron powder shall be suitably marked to identify the name or trade-mark of the manufacturer, grade and mass.

*Method for determination of apparent density of powders for powder metallurgical purposes.

†Method for determination of flow rate of powders for powder metallurgical purposes.

‡Method for determination of compressibility of ductile metal powders

§Methods for sampling of powders for powder metallurgical purposes.

9.1.1 The material may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.